

# LIVING BREAKWATERS CAC MEETING

02/23/2022



Governor's Office of  
Storm Recovery

DESIGN

SCAPE

COWI

ARCADIS

wsp

seac  
Ecological Marine Consulting

MES

CONSTRUCTION  
MANAGEMENT

RAMBOLL

Baird.  
Innovation Engineered.

CONSTRUCTION

WEEKS

**WELCOME!**

# LIVING BREAKWATERS

An aerial photograph of a coastal city, likely San Francisco, showing a dense urban grid of buildings and streets. The city is bordered by a body of water. A breakwater project is visible, consisting of several long, rectangular structures extending from the shoreline into the water. The water is a deep blue, and the shoreline is a mix of green vegetation and sandy areas. The breakwater structures are light-colored, possibly concrete or stone, and are arranged in a line that follows the curve of the coast. The overall scene is a mix of urban development and natural coastal features.

Spring 2022

# Agenda

**Construction Schedule**

**Construction Progress Update**

**Navigation Safety During Construction**

**Next 3 Months**

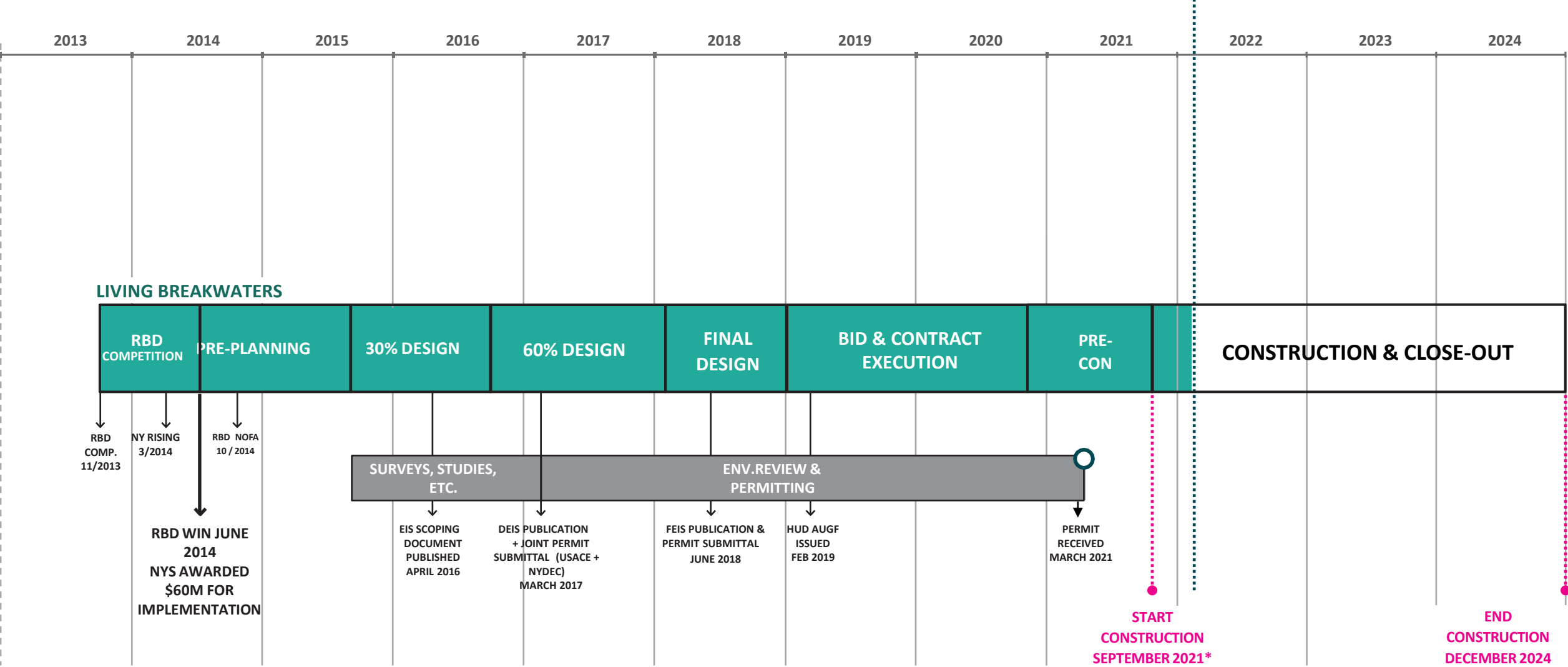
**Q&A**

# Schedule



# PROJECT TIMELINE

LIVING BREAKWATERS  
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# Overview of the Final Design



BREAKWATER A

BREAKWATER B

BREAKWATER C

BREAKWATER D

BREAKWATER E

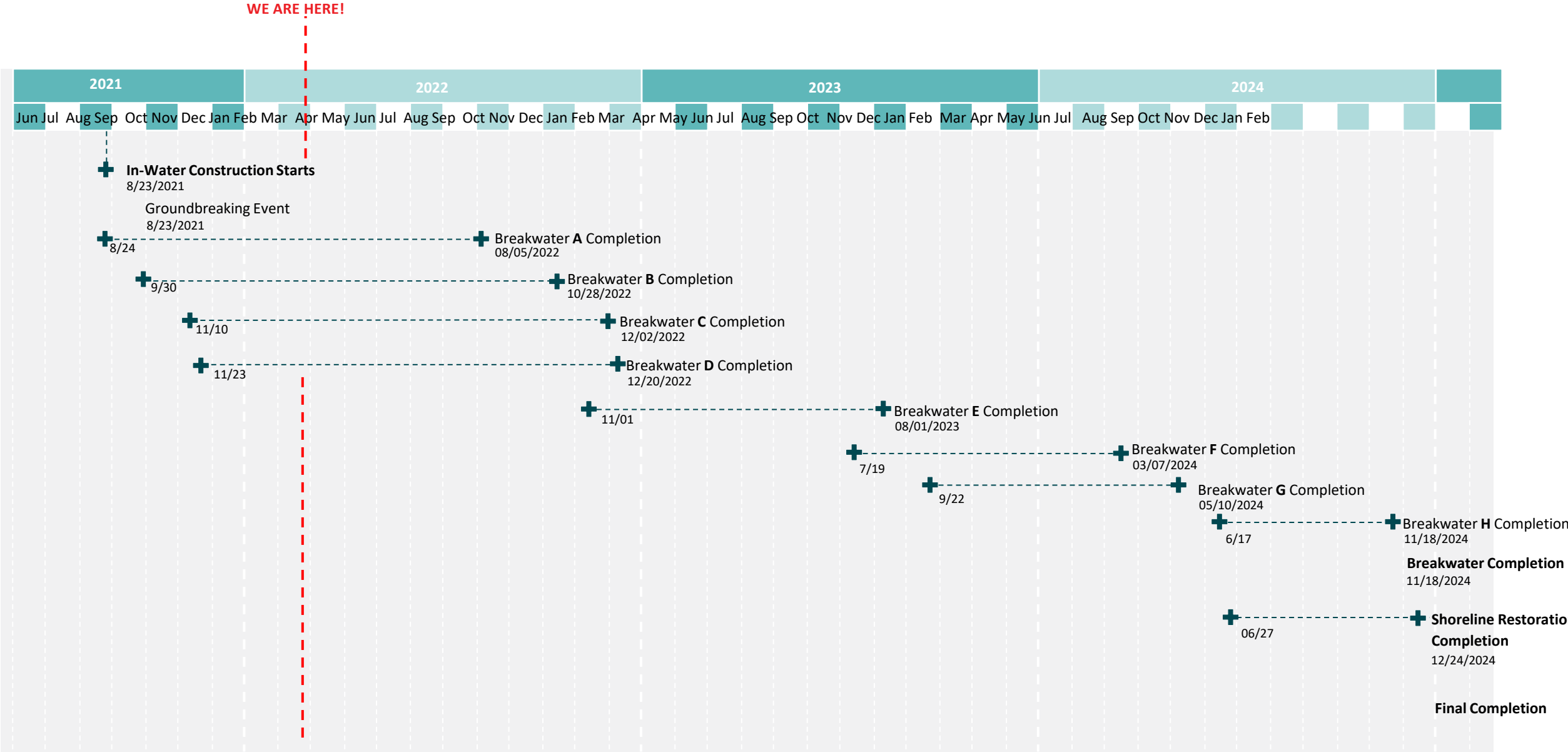
BREAKWATER F

BREAKWATER G

BREAKWATER H

ANTICIPATED PROJECT TIMELINE

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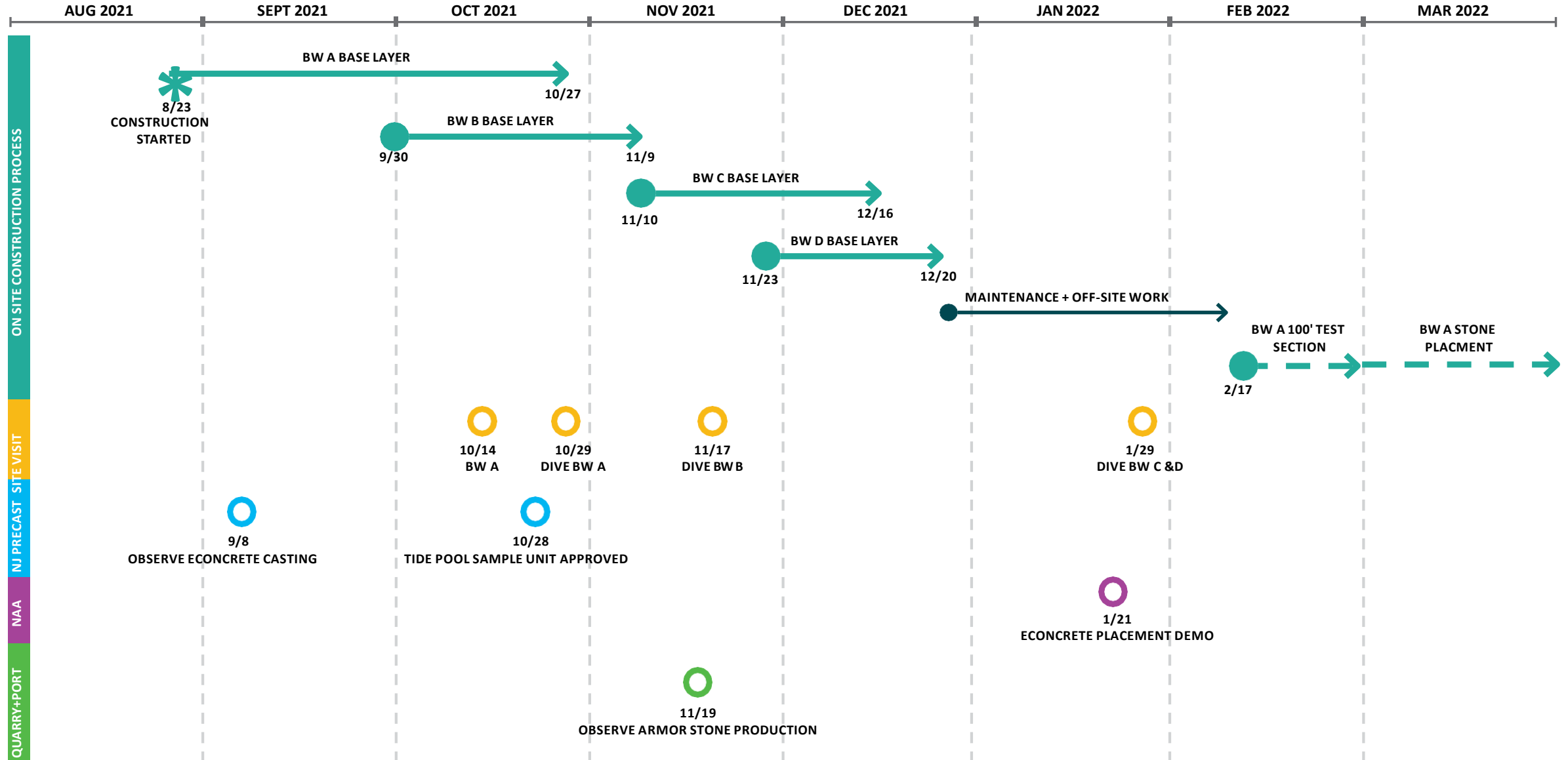




# Progress Update

# CONSTRUCTION PROGRESS

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# Work is taking place across 6 locations

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**CARVER STONE QUARRY**  
Johnstown, NY



**PORT OF COEYMANS**  
Ravena, NY



**NJ PRECAST PLANT**  
Ewing Township, NJ



**NORTH AMERICAN AGGREGATES**  
Perth Amboy, NJ



**GREENVILLE YARD**  
Jersey City, NJ



**LBW PROJECT SITE**  
Tottenville, Staten Island, NY





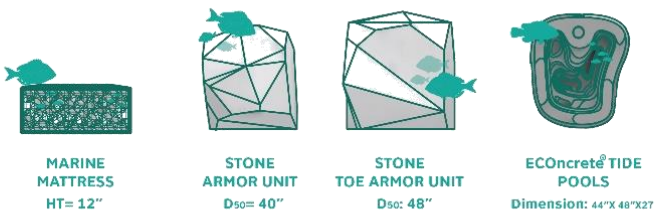
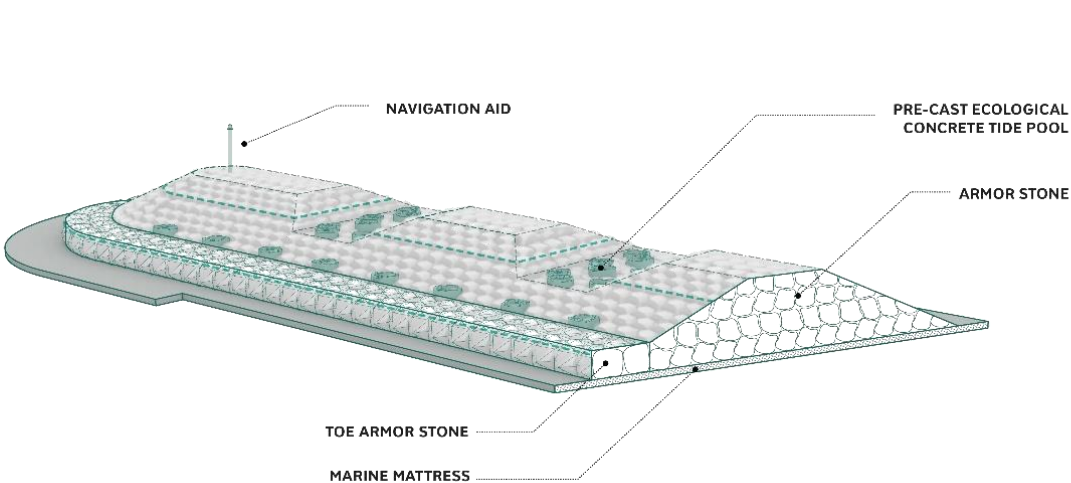
# What has happened so far



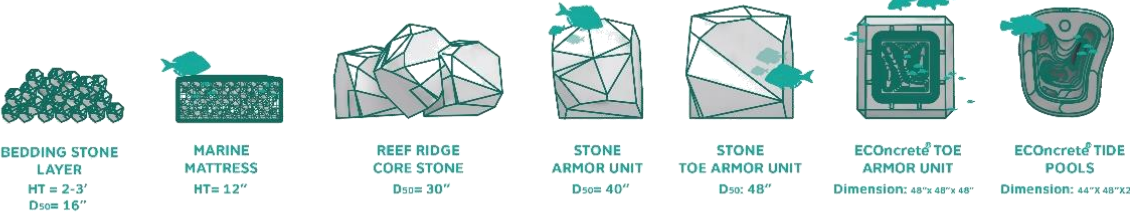
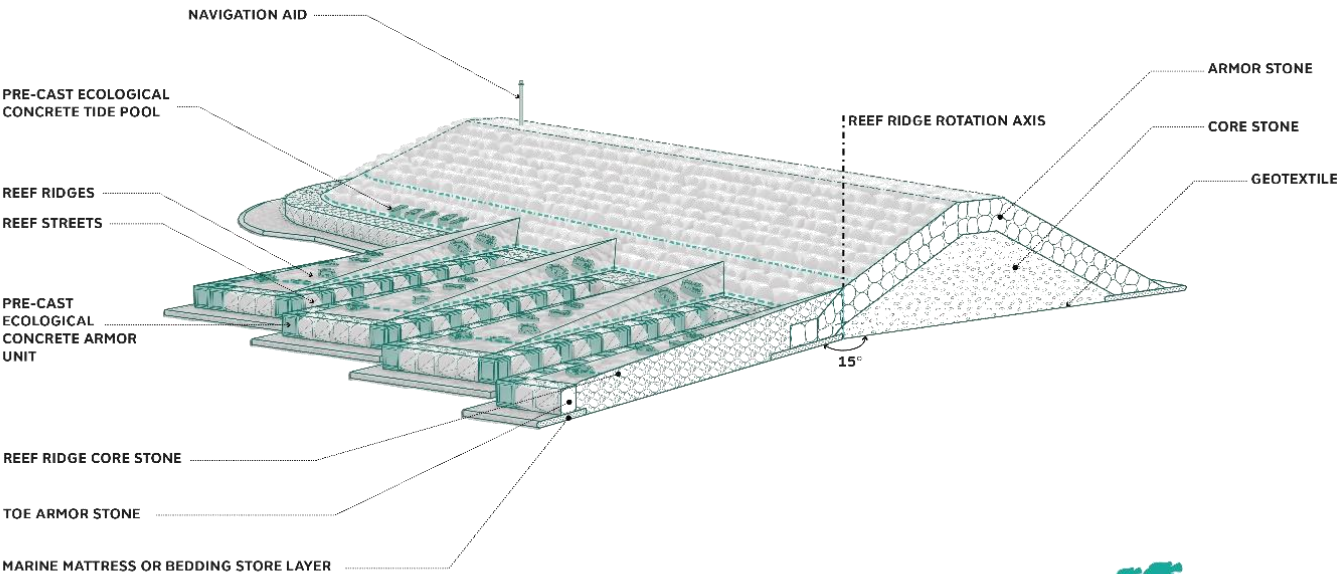


# Breakwater Components

BREAKWATERS A & B



BREAKWATERS E, F, G, H



# Base Layer Construction (Breakwaters A, B, C, D)

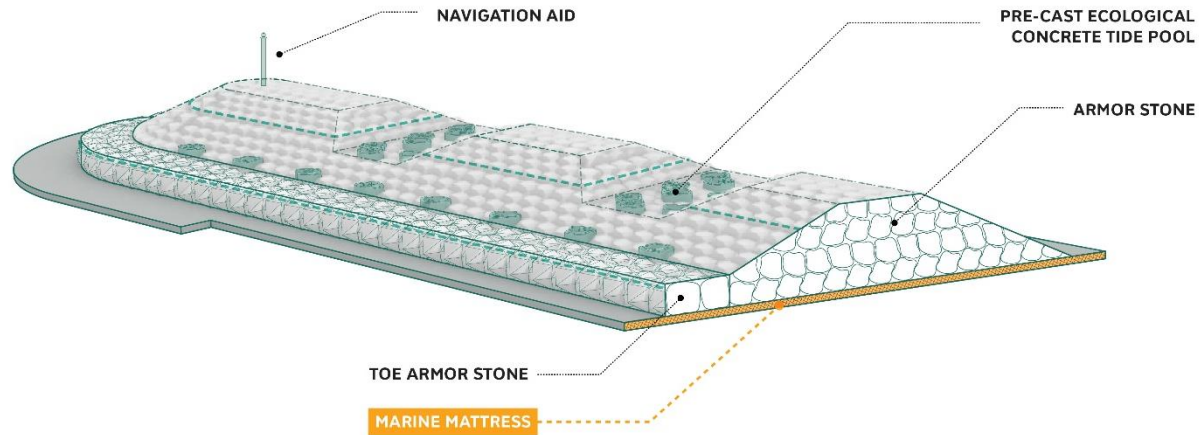
September - December 2021 (Complete)

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## BREAKWATERS A & B





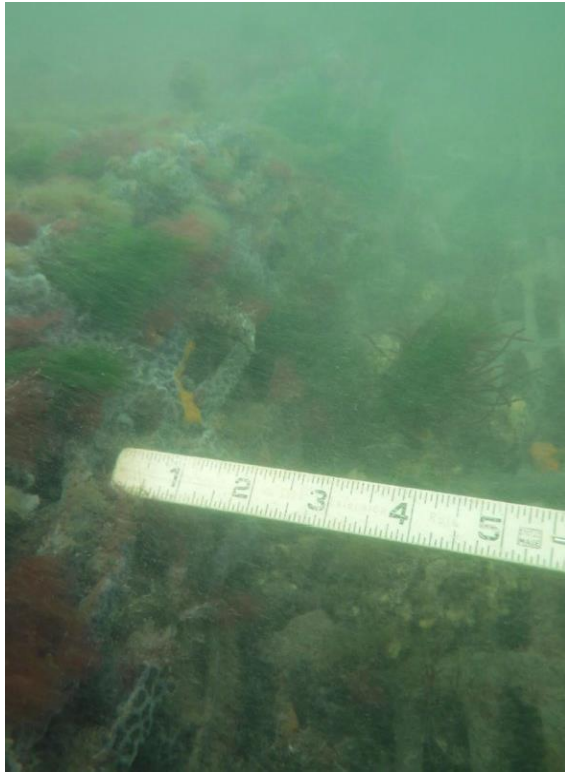
# Base Layer Construction (Breakwaters A, B, C & D)

September - December 2021 (Complete)

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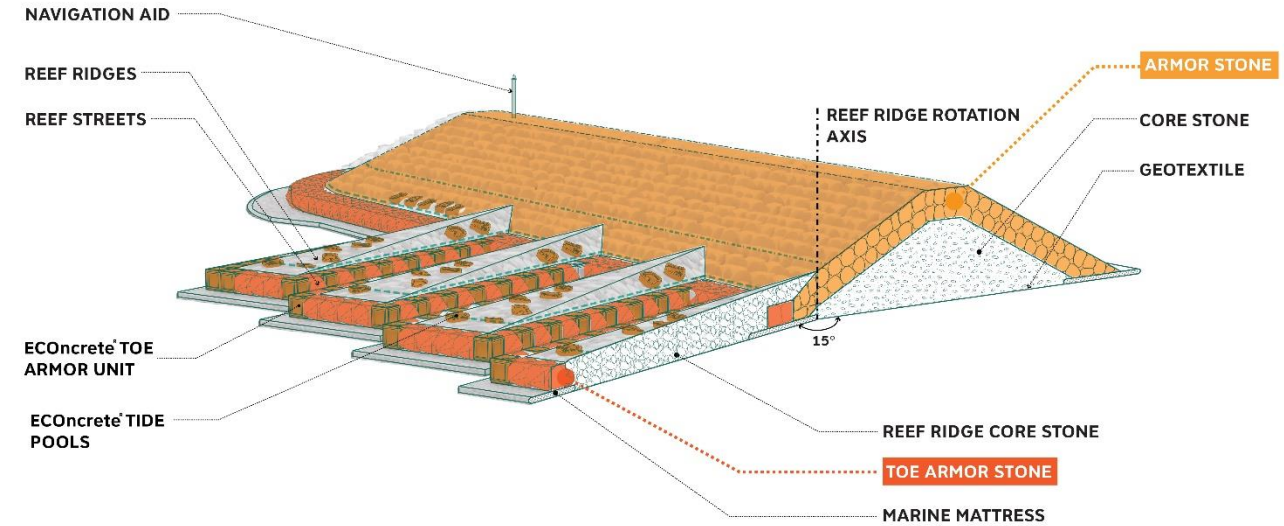
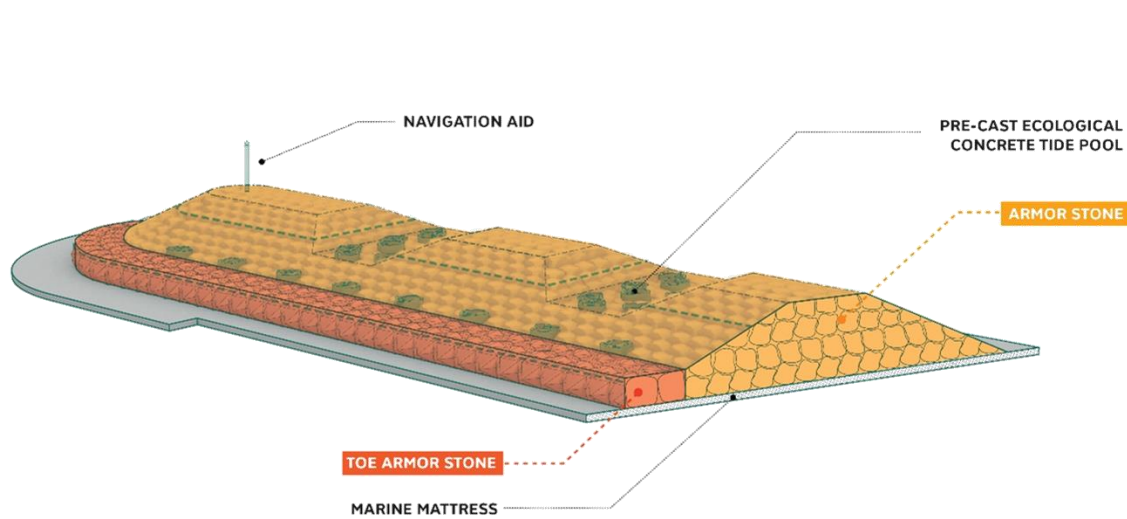
# Stone

Production: September 2021 - Ongoing, Placement: February 2022

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# Stone

Production: September 2021 - Ongoing, Placement: February 2022

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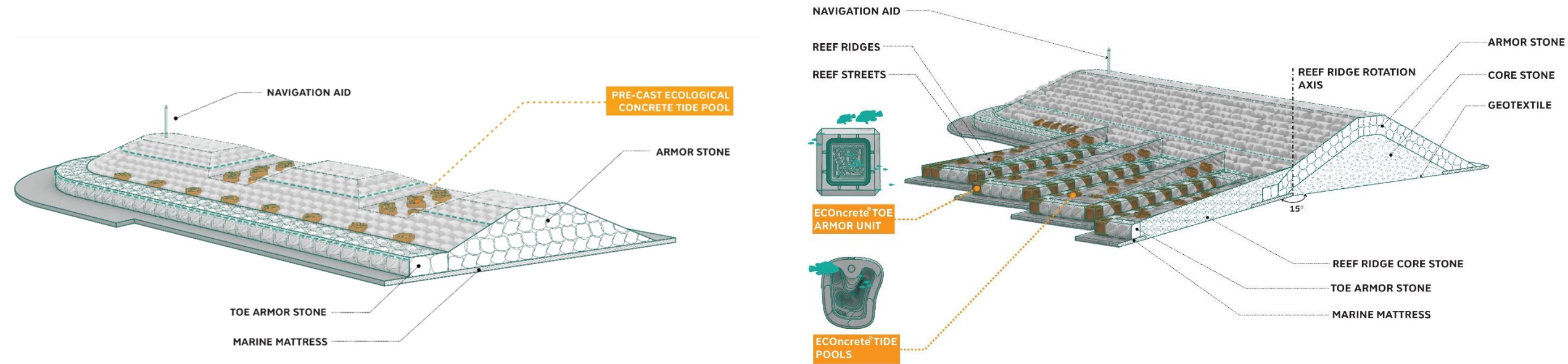
# Ecological Precast Unit Production

Production: September 2021 - Ongoing, Placement: February 2022

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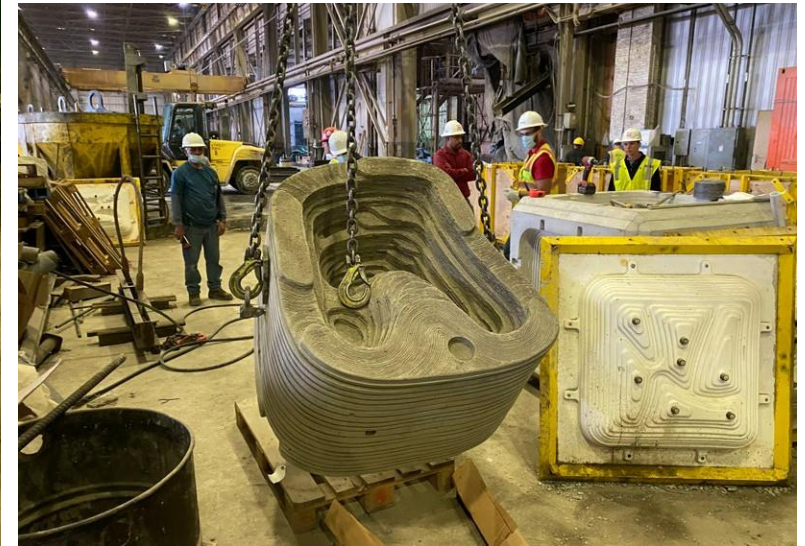
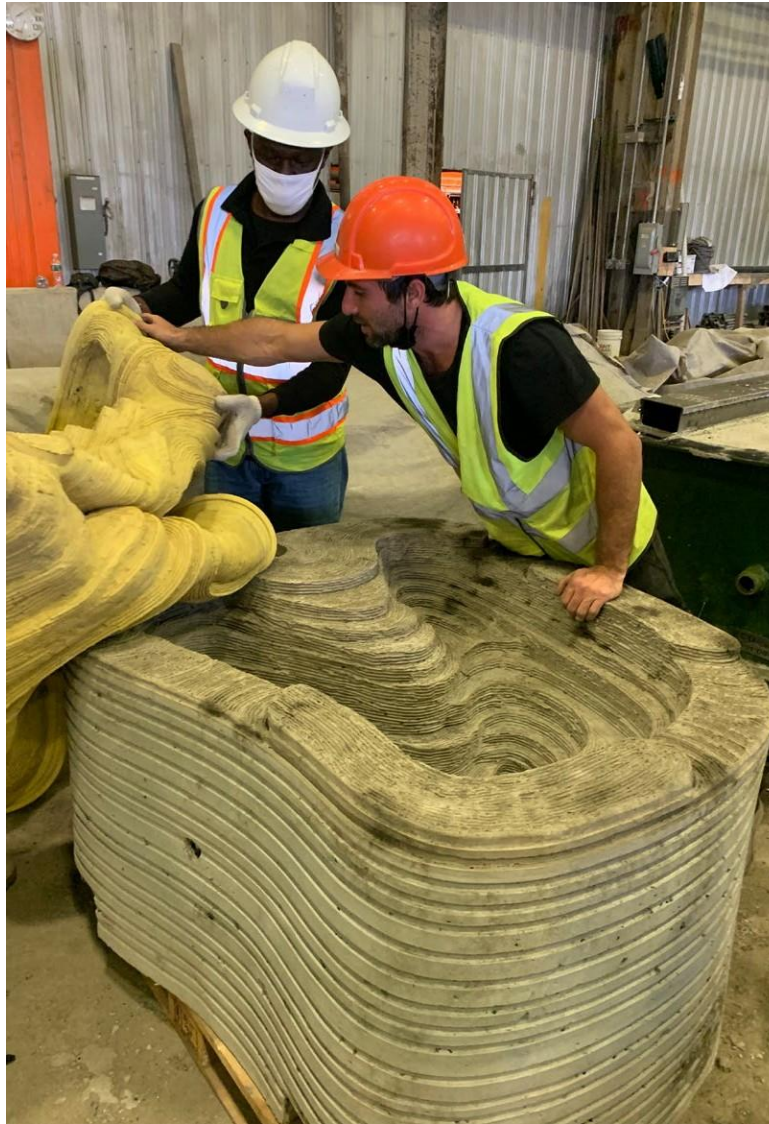
# Ecological Precast Unit Production

September 2021 - Ongoing

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# Ecological Precast Unit Placement Demo

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**FLAT PLACEMENT OF AN ECONCRETE TIDE POOL UNIT IN TRUNK**



**FLAT PLACEMENT OF ECONCRETE ARMOR UNITS WITH TOE STONE IN TRUNK OCEAN-SIDE TOE OR REEF RIDGE**



**SLOPED PLACEMENT OF ECONCRETE UNITS WITHIN ONE LAYER OF ARMOR STONE**



# Safety & Navigation

# Navigation Safety Measures in place During Construction

- **Project Signage**
- **Notice to Mariners**
- **Navigation Flyer**
- **W537, Work barges and Tugs Navigation lighting**
- **Anchor Spread**
- **Breakwater footprints are marked**

# Project signage

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## Page Ave



## Sprague Ave



## Conference House Park





# Notice to Mariner + Navigation flyer

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**Notice to Mariners** – official notice with the USCG regarding the construction zone, construction activity, vessels being used, and Closest Point of Approach

**Navigation flyer** – sent out to the maritime community describing the project, project location, construction zone, contact numbers, and request to avoid the area.

## LIVING BREAKWATERS FOR STATEN ISLAND & RARITAN BAY

### INFORMATION FOR MARINERS

Living Breakwaters is a blue-green infrastructure project designed to reduce erosion and damage from storm waves, improve ecosystem health, and support education and stewardship across Staten Island and Raritan Bay.

Construction began in September 2021 and will be completed by the fall of 2024. The construction work zone will be marked with lighted buoys and posts that are subject to regular change.

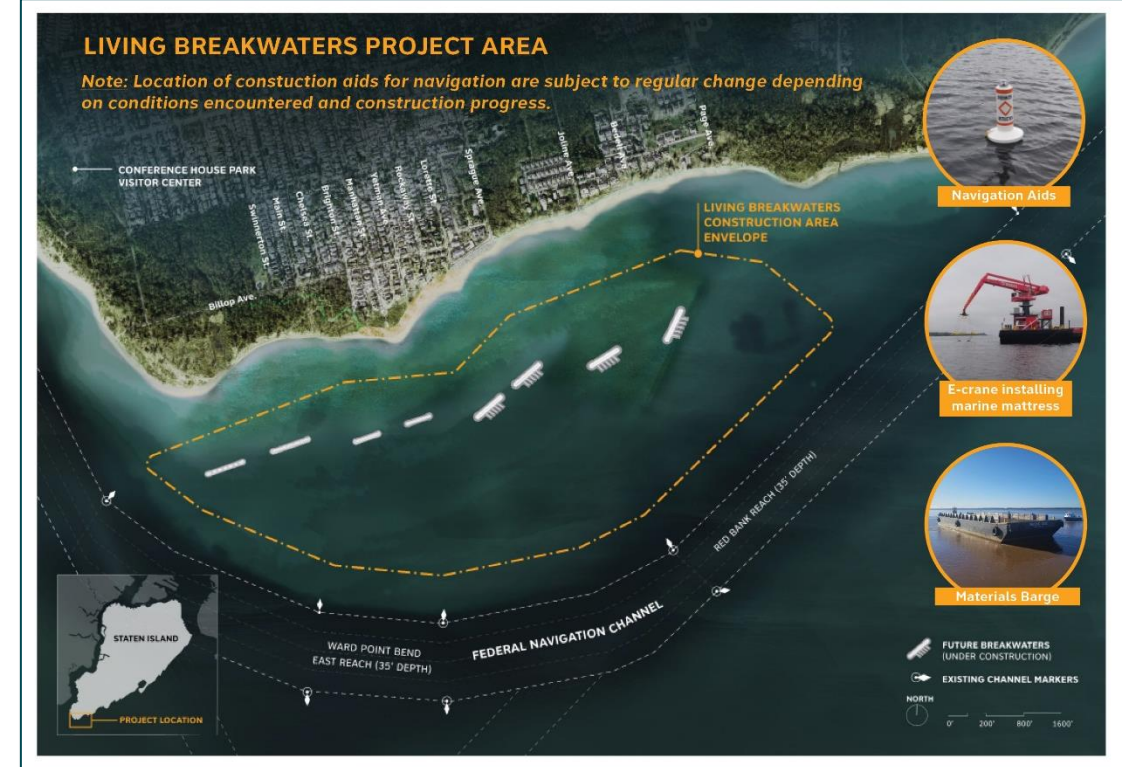
Breakwater construction will generally proceed from the southwest, where the first breakwater will be installed, to the northeast. Partially constructed breakwaters may or may not be visible above water. Construction barges will be moored in the vicinity of the construction zone and will be marked with lights

on four corners. Anchors will also be marked with lighted buoys. During work hours, divers will be present in the water.

Mariners and recreational craft should avoid this area and keep their closest point of approach at least 0.5 nautical miles (3,308 feet) from buoys, lighted posts, and barges. Please refer to the [Local Notice to Mariners](#) for more information.

New York State Governor's Office of Storm Recovery (GOSR) can be reached by email at [info@stormrecovery.ny.gov](mailto:info@stormrecovery.ny.gov); or by phone at **212-480-2321**. For more information on the project and construction updates please visit the project website at <https://stormrecovery.ny.gov/living-breakwaters-tottenville>.

### CONSTRUCTION SCHEDULE



Link: <https://stormrecovery.ny.gov/living-breakwaters-construction-updates#navigation>



# Navigation Safety Outreach to Local Mariners, Boaters and Fishermen





# What will you see during construction?



Navigation Aids



Stake Barge



E-crane



Amhibious  
Excavator



E-CRANE IN  
RARITAN BAY



Materials Barge



Docked Materials  
Barge

All vessels and anchor locations have navigation light.



# Breakwater under construction marking

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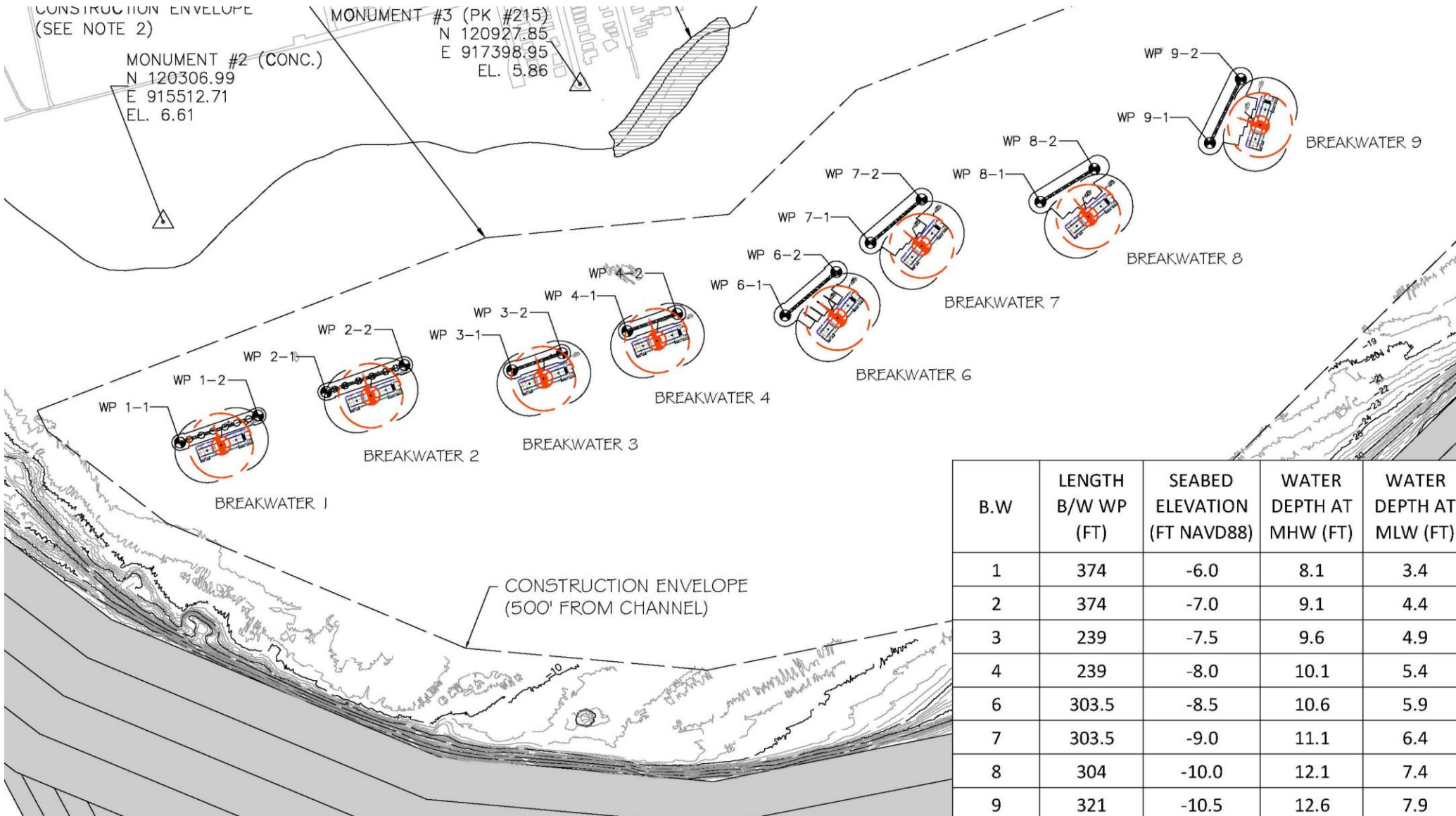
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- **Breakwater footprints are marked** – the breakwaters that are under construction are delineated with lighted posts and buoys. BW 1 toe stone, commenced on Feb 17, is above water at low tide. BW 3 and 4 are above water around low tide.



**Breakwater 1 Marking**

# Anchor Spread Location



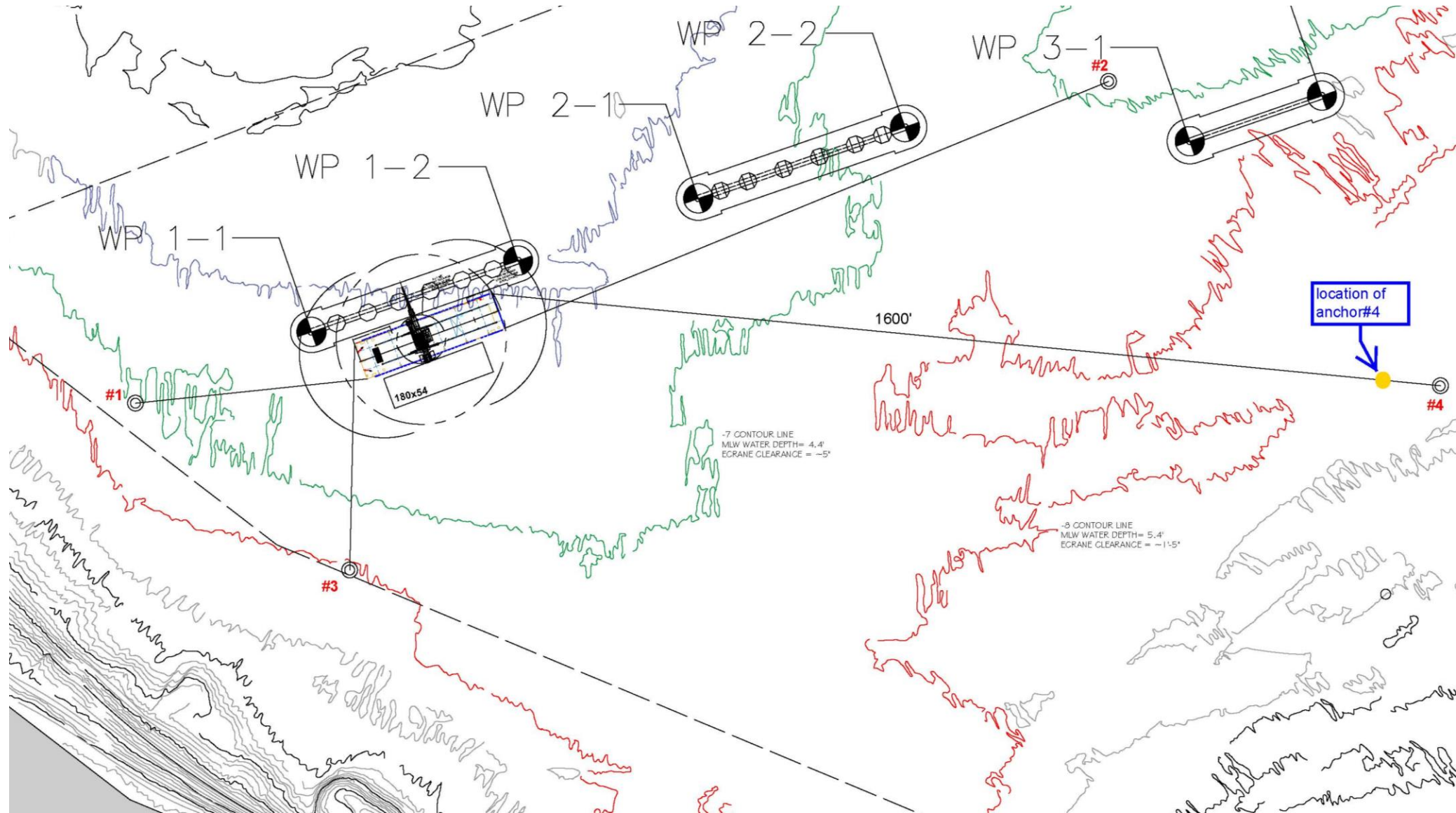


# Anchor Spread Location

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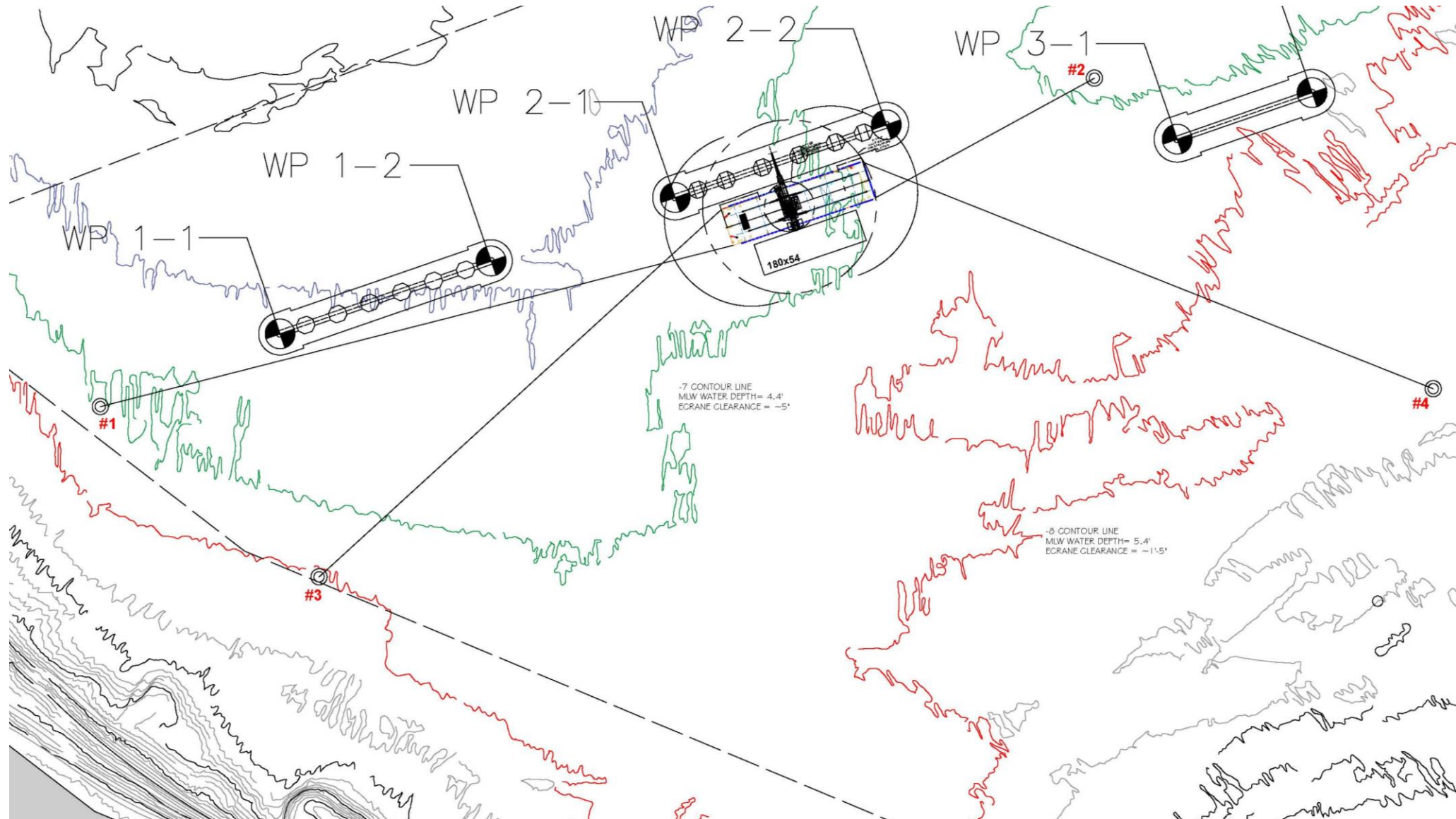


# Anchor Spread Location

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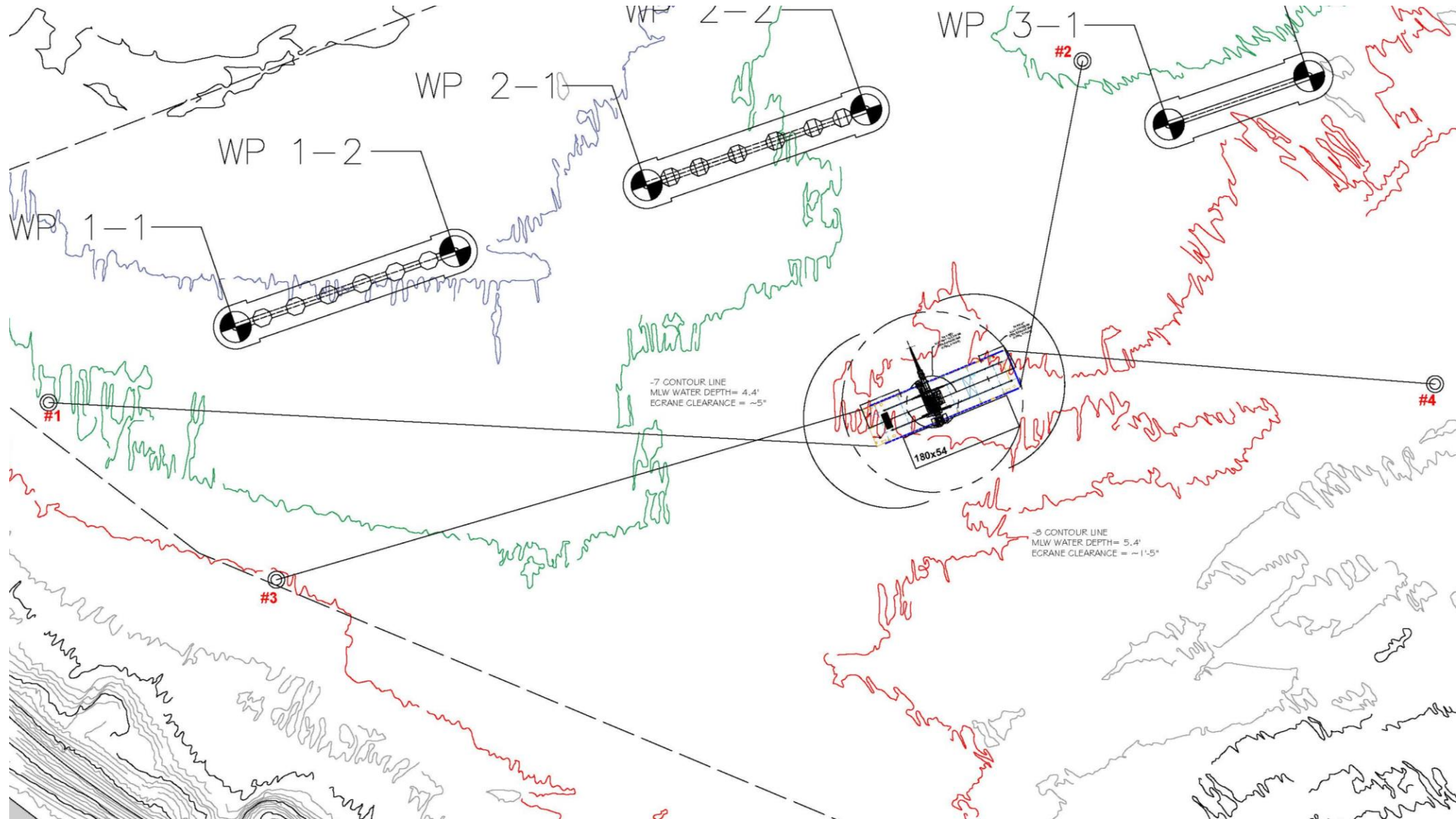


# Anchor Spread Location


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# Monthly Construction Updates



ServicesNewsGovernmentCOVID-19 Vaccine

Q Search

GOVERNOR'S OFFICE OF STORM RECOVERY (GOSR)

Programs

Rebuild by Design

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Funding

Doing Business with GOSR

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Living Breakwaters Construction Updates

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[Navigation Safety for Local Mariners]


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JANUARY 2022 UPDATE


JANUARY 2022 CONSTRUCTION UPDATE

Happy New Year! As of the end of last year, work on the base layers of Breakwaters 'A', 'B', 'C', and 'D' was completed! In the first couple weeks of 2022, the contractor has been working off-site to make modifications to the W537 E-crane barge and preparing it for stone placement operation. The crane, which was used to place marine mattresses that form the breakwaters' base layers, will be adjusted enabling the machine to assist with installing breakwater stone. Work on site is scheduled to restart very soon and you can expect to see the familiar sight of the red crane barge in the water.

Stones are continuing to be produced, sorted, and inspected at Carver Quarry, and delivered to the site. The contractor will continue placing core and begin armor stones which respectively constitute the inner and outer layers of the breakwaters (you can learn more about these stones in our fun fact excerpt at the end of this update). Emergent areas of the Breakwater A should become visible from shore in February. Earlier this month, the construction manager and design team observed the placement demonstration of EConcrete® units at North American Aggregates in Perth Amboy, NJ. You can see some photos of the visit below.







Link: <https://stormrecovery.ny.gov/living-breakwaters-construction-updates#navigation>



# 3-month Look-ahead

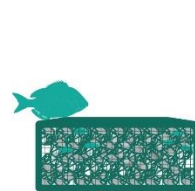
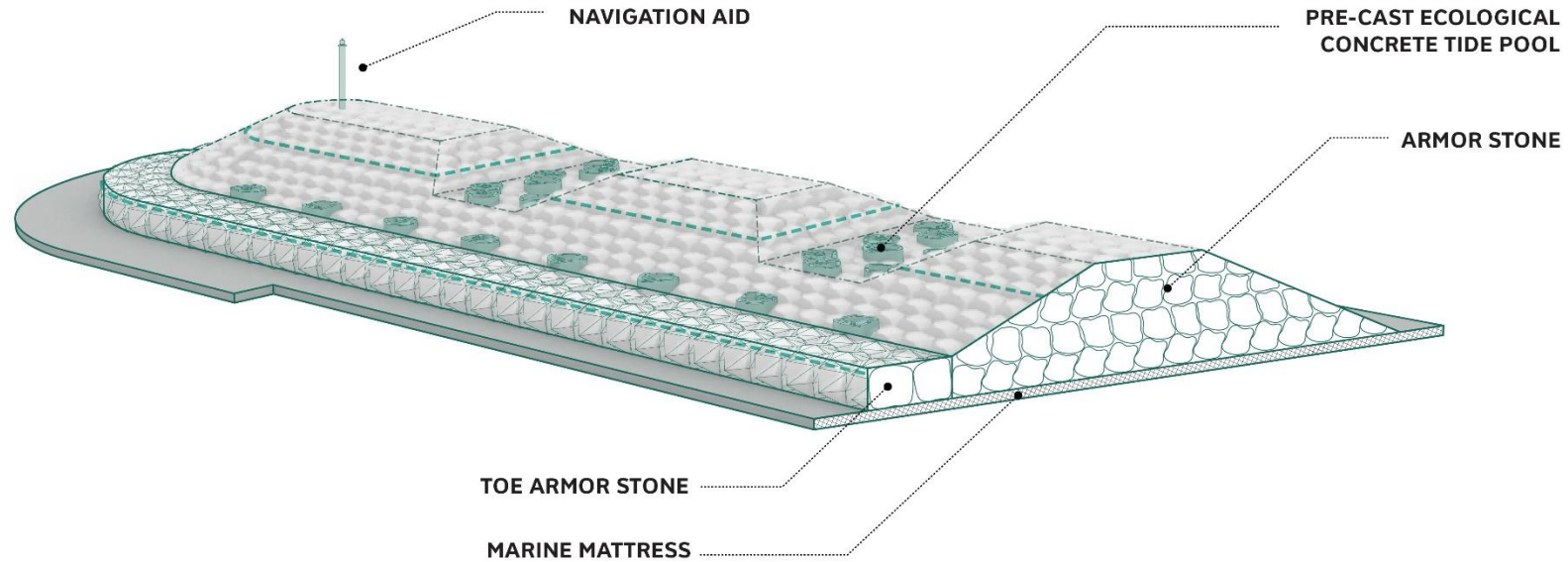
# 6-month Look-ahead

- Breakwater A 100' test section completion – mid-March, 2022
- Breakwater A completion – Fall 2022
- Breakwater B completion – Fall 2022
- Breakwater C Completion – Winter 2022
- Breakwater D Completion – Winter 2022



# Breakwater 1

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MARINE  
MATTRESS  
HT= 12"



STONE  
ARMOR UNIT  
D<sub>50</sub>= 40"



STONE  
TOE ARMOR UNIT  
D<sub>50</sub>: 48"



EConcrete® TIDE  
POOLS  
Dimension: 44"X 48"X27

# Q&A



An aerial photograph of a coastal city. The left side shows a dense urban area with many small buildings. A green peninsula with some trees and a small body of water is in the center. The right side shows a large body of water with several small boats. The text "THANK YOU!" is overlaid in the center.

**THANK YOU!**